ETHICAL HACKING

Ethical hacking is the **authorized and legal practice of testing computer systems, networks, or applications to identify security weaknesses before malicious attackers can exploit them**. Ethical hackers use many of the same techniques as cybercriminals, but only with explicit permission from the system owner.

Types of ethical hacking

- **Network hacking:** Tests the security of networks, routers, firewalls, and servers.
- **Web application hacking:** Identifies vulnerabilities such as SQL injection and cross-site scripting (XSS).
- **Wireless hacking:** Evaluates the security of Wi-Fi networks and wireless devices.
- **Mobile application hacking:** Assesses Android and iOS apps for security flaws.
- **Cloud security testing:** Reviews cloud infrastructure and configurations for weaknesses.

Typical ethical hacking process

1. **Planning and authorization** – Obtain written permission and define the scope.
2. **Reconnaissance** – Gather information about the target.
3. **Scanning and enumeration** – Identify systems, services, and potential vulnerabilities.
4. **Vulnerability assessment** – Analyze security weaknesses.
5. **Controlled exploitation** – Verify vulnerabilities without causing damage.
6. **Reporting** – Document findings and recommend fixes.
7. **Remediation and retesting** – Confirm that vulnerabilities have been resolved.

Skills needed

- Networking (TCP/IP, DNS, routing)
- Operating systems (Linux and Windows)
- Programming and scripting (Python, Bash, JavaScript)
- Web technologies (HTML, CSS, HTTP)
- Cybersecurity concepts (encryption, authentication, access control)

Common tools

- Nmap (network discovery)
- Wireshark (packet analysis)

- Burp Suite (web application testing)
- Metasploit (authorized penetration testing)
- OWASP ZAP (web security testing)

Certifications

- Certified Ethical Hacker (CEH)
- CompTIA PenTest+
- ELearn Security eJPT
- Offensive Security Certified Professional (OSCP)

Career opportunities

Ethical hackers work as:

- Penetration Testers
- Security Analysts
- Security Consultants
- Red Team Specialists
- Cybersecurity Engineers

The key difference between an ethical hacker and a malicious hacker is **permission and intent**. Ethical hackers have authorization to test systems and help organizations improve their security, whereas malicious hackers access systems without permission and often seek to steal data or cause harm.

EXCELLENCE TECHNOLOGY

Technology is an ISO 9001:2015 certified software development and industrial IT training company. While its regional training center is located in Hamirpur, Himachal Pradesh, its corporate head office is based in Mohali, Punjab. The institute provides career-oriented professional computer education, software engineering courses, and job placement assistance.

The institute offers 6-week and 6-month specialized industrial training and internship programs designed for B.Tech, MCA, BCA, and diploma students. [1]

- **Full Stack Web Development:** Master front-end (HTML, CSS, JavaScript) and back-end scripting (Python) alongside MySQL and MongoDB database management. [1]
- **Python Programming:** Practical training covering fundamental scripts, object-oriented concepts, web scraping, and specialized libraries like Pandas and NumPy. [1]
- **Digital Marketing & SEO:** Built for students and entrepreneurs looking to master search engine optimization, content strategy, and online marketing channels. [1]
- **Web Designing:** Hands-on training focused on responsive user interfaces using industry-standard design tools like Adobe XD, Figma, and Bootstrap.
- **C & C++ Programming:** A foundational programming track covering core software development frameworks and data structures

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